

a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and
bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

a package in which the band-pass filter is mounted, contains a piezoelectric substrate and the ground; and

the plurality of SAW resonators are on the piezoelectric substrate.

36. (NEW) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and
bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

a package in which the band-pass filter is mounted contains a piezoelectric substrate;

the plurality of SAW resonators are on the piezoelectric substrate; and

a first electric resistance (R_s) of an interdigital electrode of a SAW resonator provided in a series arm, is smaller than a second electric resistance (R_p) of an interdigital electrode of a SAW resonator provided in a parallel arm which is next to the series arm.

REMARKS

This Amendment is supplemental to the Amendment filed July 25, 2002. By this Amendment, new claims 35 and 36 are added and a correction is made in the specification to correct an error introduced by the July 25, 2002 Amendment.

New claims 35 and 36 are similar to claim 4 of the parent application (now U.S. Patent RE 37,790) in that they recite the features of that claim plus additional features. Therefore, it is

submitted that claims 35 and 36 patently distinguish over the prior art.

Information Disclosure Statement

An Information Disclosure Statement is being submitted herewith to bring to the Examiner's attention the following documents:

1. Crystal Filters Second Quarterly Report (1 July. 1960 to 1 October 1960) (Hereinafter "**2Q Report**").
2. Crystal Filters Third Quarterly Report (1 Oct. 1960 to 1 Jan. 1961) (Hereinafter "**3Q Report**").
3. Crystal Filters Sixth Quarterly Report (15 Sept. 1961 to 15 Dec. 1961) (Hereinafter "**6Q Report**") (excerpts only).
4. Crystal Filters Seventh Quarterly Report (15 Dec. 1961 to 15 March 1962) (Hereinafter "**7Q Report**") (excerpts only).
5. Crystal Filters Final Report (August 15, 1963)
6. J.E. Colin, "Narrow Bandpass Ladder Filters Utilizing Piezoelectric Crystals and Having Attenuation Poles in the Lower Stop Band", Cable and Transmission (Oct. 1962) (Original in French Language, English Language translation provided, Hereinafter "**Colin**").

As an initial matter, it should be noted that applicants do not know whether any or all of the Motorola Documents (items 1-5 above) constitute "prior art" printed publications under 35 USC §§102/103. Specifically, these references may not constitute "printed publications" because they may not have been available to the public. For example, applicants have been unable to locate the entirety of the 6Q and 7Q reports (items 3 and 4), so that only certain pages which were recently identified by a potential licensee, have been provided. Therefore, applicants do not in any way acknowledge or admit that items 1-5 above constitute "prior art", but instead reserve the right to argue that these documents are not prior art. However, even if these documents are prior art, applicants believe that the present invention clearly distinguishes over these documents based on their lack of relevant content.

Referring to the above documents, the 6Q Report (item 3 above) discloses a T-shape ladder circuit that contains three crystal resonators with an inductor at the parallel resonator, as shown in Fig. 16. The Final Report (item 5) discloses a multiple ladder structure in Fig. 92 that contains a plurality of crystal resonators with inductors at the parallel resonators. The 2Q, 3Q and 7Q Reports (items 1, 2 and 4 above) disclose crystal resonators, and experiments and data

relating to such resonators. None of these 40-year old Motorola Documents disclose SAW resonators or suggest in any way that the teachings in the Reports are applicable to SAW resonators. The disclosed crystal resonators are discrete devices, and therefore cannot be formed on a single substrate as can a SAW filter device.

The subject application has several claims relating to an inductance element, namely claims 22, 23 and 24 and new claims 35 and 36. Since claims 22 and 23 recite the film thickness of the exciting electrode, the Motorola Documents are clearly not relevant to these claims. Claims 24, 35 and 36 recite a plurality of series and parallel arms on a single piezoelectric substrate. Since the Motorola Documents disclose crystal resonators which are discrete devices and can therefore never be composed on a single substrate as a SAW device, it is submitted that claims 24, 35 and 36 are not rendered obvious by the Motorola Documents. Therefore, the Motorola Documents are not relevant to the subject application.

Similarly, Colin et al. (item 6 above) appears to show a crystal resonator ladder filter having inductors in the parallel arms. As with the Motorola Documents, the Colin resonators are discrete devices and are not formed on a single substrate. In addition, Colin has a capacitance in parallel with the parallel resonator and between the series resonator and parallel resonator. This configuration is different from the claimed invention.

Applicants submit that design concepts established for crystal ladder structures cannot be simply applied to a SAW ladder filter. It is noted that the above-described type of crystal ladder structures or their equivalent, have not been cited by the U.S.P.T.O. in this application or its various related applications in spite of many years of rigorous examination and reissue proceedings. In addition, applicants have many licensees for the related applications which have already issued, and none of these licensees has attempted to rely on references having the type of technology disclosed in items 1-6 above. Although a recent potential licensee has cited certain ones of the Motorola Documents (items 1-5) and the Colin et al reference (item 6), the prior extensive examination is strong evidence that it would not have been obvious to apply such crystal ladder teachings to SAW devices.

Figs. 11 and 13 of the 6Q Report (item 3) show the characteristics of the circuit of Fig. 9 (without an inductor). Figs. 18 and 20 show the characteristics of the circuit of Fig. 16 (with an inductor). Comparing those figures, although the high side lobe suppression is improved, low side lobe suppression is not improved. In fact, the high side lobe suppression around the vicinity of the center frequency (about 2095-2099 KHz) actually becomes worse. While this

effect might be satisfactory for a crystal filter, the required characteristics of inductance elements of a SAW filter to which this application and its patent family are directed, are much more severe due to the substantially higher frequencies utilized in SAW devices. Thus, one of skill in the art would have known of these different requirements and would not have assumed that crystal filter inductors could have been used in a SAW filter.

Furthermore, during the prosecution of the parent and related applications, applicants pointed out the difference between the claimed SAW resonators and the transversal-type SAW devices disclosed in the Misu reference (USP 4,954,793) cited by the Examiner. (See U.S. patent application No. 08/369,492 (which issued as U.S. Patent 5,631,612 patent), paper No. 17 (amendment filed 9/09/96), pp. 4-5). The Examiner allowed the application after this argument was advanced, thereby accepting applicants' arguments that such non-SAW resonator prior art was not relevant. No other non-SAW resonator art was relied on by the Examiner during the reissue prosecution which lead to U.S. Patents RE 37,375 and RE 37,790. It is thus clear that non-SAW resonator references, such as the above-described crystal-resonator references, should not be considered to be closer to the claimed subject matter than the references over which the claims of U.S. Patents RE 37,375 and RE 37,790 were allowed. Similarly, in the current application, the non-SAW resonator references are not as relevant as the prior art which is already of record.

In view of the above, applicants submit that the Motorola Documents and the Colin reference would not have provided any motivation to modify the disclosed crystal resonator ladder structures to produce the claimed SAW resonator ladder structures of the subject application and its related applications. Any argument to combine the 40-year old crystal resonator art Motorola Documents with a SAW filter thus simply becomes a classic application of impermissible hindsight. For these reasons, the crystal resonator art would not have been applied to SAW resonator devices, and the subject claims and the claims of the related applications and patents are patentable over these documents.

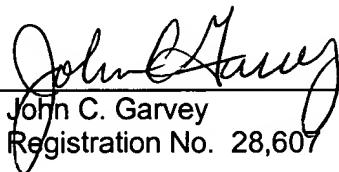
Summary

In summary, it is submitted that the claims, as amended, are all in condition for allowance. Reconsideration of the claims and an early notice of allowance are earnestly solicited.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the specification as follows. Please note that the bracketing and underlining are provided under 37 CFR §1.173(d):

Please insert before the first sentence the following:

This application and copending Application No. 09/314,943, filed May 20, 1999 (now U.S. Patent RE 37,790), are each reissues of U.S. Patent No. 5,631,612 (Application No. 08/369,492, filed January 6, 1995).